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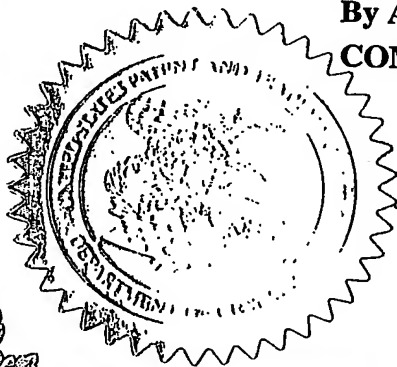
THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: 60/476,136

FILING DATE: June 05, 2003

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6-60476136-060503 *Alper*

13142 U.S. PTO
06/05/03

Practitioner's Docket No. U 014639-3

PATENT

14772 U.S. PTO
60/476136
06/05/03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: KRISTIAN KNAK NYGAARD, et al

For: SYSTEM FOR DOWNLOADING TELEVISION INFORMATION TO EXTERNAL DEVICES
AND MEDIA

Mail Stop Provisional Patent Application
Assistant Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

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00140

PATENT TRADEMARK OFFICE

COVER SHEET FOR FILING PROVISIONAL APPLICATION
(37 C.F.R. § 1.51(c)(1))

WARNING: "A provisional application must also include the cover sheet required by § 1.51(c)(1) or a cover letter identifying the application as a provisional application. Otherwise, the application will be treated as an application filed under paragraph (b) [nonprovisional application] of this section." 37 C.F.R. § 1.53(c)(1). See also M.P.E.P. § 201.04(b), 6th ed., rev. 3.

CERTIFICATION UNDER 37 C.F.R. 1.10*
(Express Mail label number is mandatory.)
(Express Mail certification is optional.)

I hereby certify that this correspondence and the documents referred to as attached therein are being deposited with the United States Postal Service on JUNE 5, 2003, in an envelope as "EXPRESS MAIL POST OFFICE TO ADDRESSEE" service under 37 C.F.R. 1.10 Mailing Label Number EV 327548200 US addressed to the Assistant Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

CYNTHIA PADGETT
(type or print name of person mailing paper)

Cynthia Padgett
Signature of person mailing paper

WARNING: Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.

***WARNING:** Each paper or fee filed by "Express Mail" must have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. 1.10(b).
"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will not be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.

NOTE: "A complete provisional application does not require claims since no examination on the merits will be given to a provisional application. However, provisional applications may be filed with one or more claims as part of the application. Nevertheless, no additional claim fee or multiple dependent claims fee will be required in a provisional application." Notice of December 5, 1994, 59 FR 63951, at 63953.

"Any claim filed with a provisional application will, of course, be considered part of the original provisional application disclosure." Notice of April 14, 1995, 60 Fed. Reg. 20,195, at 20,209.

NOTE: "A provisional application is not entitled to the right of priority under 35 U.S.C. 119 or 365(a) or § 1.55, or to the benefit of an earlier filing date under 35 U.S.C. 120, 121 or 365(c) or § 1.78 of any other application. No claim for priority under § 1.78(a)(3) may be made in a design application based on a provisional application. No request under § 1.293 for a statutory invention registration may be filed in a provisional application. The requirements of §§ 1.821 through 1.825 regarding application disclosures containing nucleotide and/or amino acid sequences are not mandatory for provisional applications." 37 C.F.R. 1.53(c)(3).

NOTE: "No information disclosure statement may be filed in a provisional application." 37 C.F.R. § 1.51(d). "Any information disclosure statements filed in a provisional application would either be returned or disposed of at the convenience of the Office." Notice of December 5, 1994, 59 FR 63591, at 63594.

NOTE: "No amendment other than to make the provisional application comply with the patent statute and all applicable regulations, may be made to the provisional application after the filing date of the provisional application." 37 C.F.R. § 1.53(c).

NOTE: 35 U.S.C. 119(e) provides that "[i]f the day that is 12 months after the filing date of a provisional application falls on a Saturday, Sunday, or Federal Holiday within the District of Columbia, the period of pendency of the provisional application shall be extended to the next succeeding secular or business day."

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 C.F.R. § 1.51(c)(1)(i).

1. The following comprises the information required by 37 C.F.R. § 1.51(c)(1):
2. The name(s) of the inventor(s) is/are (37 C.F.R. § 1.51(c)(1)(ii)):

NOTE: "If the correct inventor or inventors are not named on filing, a provisional application without a cover sheet under § 1.51(c)(1), the later submission of a cover sheet under § 1.51(c)(1) during the pendency of the application will act to correct the earlier identification of inventorship." 37 C.F.R. § 1.48(f)(2).

NOTE: "The naming of inventors for obtaining a filing date for a provisional application is the same as for other applications. A provisional application filed with the inventors identified as 'Jones et al.' will not be accorded a filing date earlier than the date upon which the name of each inventor is supplied unless a petition with the fee set forth in § 1.17(i) is filed which sets forth the reasons the delay in supplying the names should be excused. Administrative oversight is an acceptable reason. It should be noted that for a 35 U.S.C. 111(a) application to be entitled to claim the benefit of the filing date of a provisional application the 35 U.S.C. 111(a) application must have at least one inventor in common with the provisional application." Notice of April 14, 1995, 60 Fed. Reg. 20,195, at 20,209.

The term "invention" is typically used to refer to subject matter which applicant is claiming in his/her application. Because claims are not required in a provisional application, it would not be appropriate to reference joint inventors as those who have made a contribution to the "invention" disclosed in the provisional application. If the "invention" has not been determined in the provisional application because no claims have been presented, then the name(s) of those person(s) who have made a contribution to the subject matter disclosed in the provisional application should be submitted. Section 1.45(c) states that "if multiple inventors are named in a provisional application, each named inventor must have made a contribution, individually or jointly, to the subject matter disclosed in the provisional application." All that § 1.45(c) requires is that if someone is named as an inventor, that person must have made a contribution to the subject matter disclosed in the provisional application. When applicant has determined what the invention is by the filing of the 35 U.S.C. 111(a) application, that is the time when the correct inventors must be named. The 35 U.S.C. 111(a) application must have an inventor in common with the provisional application in order for the 35 U.S.C. 111(a) application to be entitled to claim the benefit of the provisional application under 35 U.S.C. 119(e). Notice of April 14, 1995, 60 Fed. Reg. 20,195, at 20,208.

See 37 C.F.R. § 1.53.

1.	<u>KRISTIAN</u> GIVEN NAME	<u>KNAK</u> MIDDLE INITIAL OR NAME	<u>NYGAARD</u> FAMILY (OR LAST) NAME
2.	<u>SØREN</u> GIVEN NAME	<u></u> MIDDLE INITIAL OR NAME	<u>THOMSEN</u> FAMILY (OR LAST) NAME
3.	<u>SØREN</u> GIVEN NAME	<u></u> MIDDLE INITIAL OR NAME	<u>SKOV</u> FAMILY (OR LAST) NAME
4.	<u>PETER</u> GIVEN NAME	<u>PRÆST</u> MIDDLE INITIAL OR NAME	<u>PRÆST</u> FAMILY (OR LAST) NAME

3. Residence address(es) of the inventor(s), as numbered above (37 C.F.R. § 1.51(c)(1)(iii)):

1. FREDERIKSVEJ 42, ST. TV.; 2000 FREDERIKSBERG; DENMARK
2. RYESGADE 87, 4. TV.; 2100 KØBENHAVN Ø; DENMARK
3. ENGLANDSVEJ 16, 4. TH.; 2300 KØBENHAVN Ø; DENMARK
4. FRANKRIGSGADE 31, 4. TH.; 2300 KØBENHAVN S; DENMARK

4. The title of the invention is (37 C.F.R. § 1.51(c)(1)(iv)):
SYSTEM FOR DOWNLOADING TELEVISION INFORMATION TO EXTERNAL DEVICES AND MEDIA

5. The name, registration, customer and telephone numbers of the practitioner (if applicable) are (37 C.F.R. § 1.51(c)(1)(v)):

Name of practitioner: JULIAN H. COHEN

Reg. No. 20,302

Tel. (212) 708-1887

Customer No. 00140

(complete the following, if applicable)

☐ A power of attorney accompanies this cover sheet.

6. The docket number used to identify this application is (37 C.F.R. § 1.51(c)(1)(vi)):

Docket No. U 014639-3

7. The correspondence address for this application is (37 C.F.R. § 1.51(c)(1)(vii)):

Ladas & Parry, 26 West 61st Street, New York, NY 10023

8. Statement as to whether invention was made by an agency of the U.S. Government or under contract with an agency of the U.S. Government. (37 C.F.R. § 1.51(c)(1)(viii)).

This invention was made by an agency of the United States Government, or under contract with an agency of the United States Government.

☒ No
☐ Yes

The name of the U.S. Government agency and the Government contract number are:

9. Identification of documents accompanying this cover sheet:

A. Documents required by 37 C.F.R. §§ 1.51(c)(2)-(3):

Specification:	No. of pages <u>16</u>
Drawings:	No. of sheets <u>7</u>

B. Additional documents:

☒ Claims: No. of pages 1

Note: See 37 C.F.R. § 1.51.

☐ Power of attorney
☐ Small Entity Statement or Written Assertion
☐ Assignment
☐ English language translation of non-English provisional application

NOTE: A provisional application which is filed in a language other than English, does not have to have an English language translation. See 37 C.F.R. § 1.52(d)(2). However, if the provisional application is not in the English language and will later serve as a benefit of its filing date for a nonprovisional application, other than a design patent, or for an international application designating the U.S., then an English language translation must be filed in the provisional application or the later filed nonprovisional application. See § 1.78(a)(5)(iv).

- ☐ This application is in a language other than English and an English translation along with a statement of its accuracy is submitted herewith.
- ☐ Other

10. Fee

The filing fee for this provisional application, as set in 37 C.F.R. § 1.16(k), is \$160.00, for other than a small entity, and \$80.00, for a small entity.

- ☒ Applicant is not a small entity.
☐ Applicant is a small entity.

NOTE: "A . . . statement i compliance with existing § 1.27 is required to be filed in each provisional application in which it is desired to pay reduced fees." Notice of April 14, 1995, 60 Fed. Reg. 20, 195; at 20,197.

11. Small entity assertion

- ☐ The assertion that this is a filing by a small entity under 37 C.F.R. § 1.27(c)(1) is attached. ("ASSERTION OF SMALL ENTITY STATUS")
- ☐ Small entity status is asserted for this application by payment of the small entity filing fee under § 1.16(k). 37 C.F.R. § 1.27(c)(3).

WARNING: "Small entity status must not be established unless the person or persons signing the . . . statement can unequivocally make the required self-certification." M.P.E.P. Section 509.03, 6th ed., rev. 2, July 1996 (emphasis added).

12. Fee payment

- ☒ Fee payment in the amount of \$ 160.00 is being made at this time.
- ☐ No filing fee is to be paid at this time. (This and the surcharge required by 37 C.F.R. § 1.16(l) can be paid subsequently.)

13. Method of fee payment

- ☒ Check in the amount of \$ 160.00.
☐ Charge Account No. 12-0425, in the amount of \$ _____.
A duplicate of this Cover Sheet is attached.

Please charge Account No. 12-0425 for any fee deficiency.

Date: _____

Signature of submitter

Tel.: ()

Date: June 5, 2003

Reg. No.: 20,302

Tel.: (212)708-1887

Customer No.: 00140

OR



Signature of practitioner

JULIAN H. COHEN

(type or print name of practitioner)

LADAS & PARRY

P.O. Address

26 WEST 61ST STREET

NEW YORK, NEW YORK 10023

**SYSTEM FOR DOWNLOADING TELEVISION INFORMATION TO
EXTERNAL DEVICES AND MEDIA**

FIELD OF THE INVENTION

5 The present invention relates to interactive television and more particularly to interactive television services that enable downloading of television information to external devices and media.

BACKGROUND OF THE INVENTION

10 Downloading via the Internet tunes for use as telephone rings for cellular telephones is well known in the art. Also known in the art is downloading images to cellular telephones via the Internet. However, individual choice of rings and images is typically not available because users cannot choose rings and images that were not previously determined and placed in databases by providers of the
15 rings and images. Enabling individual determination of rings and images to be downloaded makes it possible for users to have an individual "touch" with regards to cellular telephone usage and is therefore considered desirable.

SUMMARY OF THE INVENTION

The present invention seeks to provide a system and method for enabling individual determination and selection of information to be downloaded from television, such as images and rings, and for downloading the individually determined images and rings to external devices and media. The external devices and media may include, for example, cellular (or mobile) telephones and other personal computing, entertaining and communicating devices. By way of example, the description below refers to downloading rings and images from an entertainment television channel. However, it is appreciated that the present invention is not limited to rings and images or to a specific channel or content provider and a service for downloading rings and images from television may 'fit' many broadcasters (assuming they have the right type of content).

The present invention also seeks to enable quick and simple use of the service because users are expected to act on impulse.

The present invention further seeks to leave a target audience as much as possible in control of a final image and/or ring downloaded to their external devices.

The terms "tune", "ring" "polyphonic ring", and "ring tone" in singular or plural are interchangeably used throughout the specification and claims to refer to music or sounds that may be used as a telephone ring or as background sounds to an application.

Preferably, the service is an integral part of watching television, that is a user may decide to download tunes and images while viewing, for example, the latest tunes presented in glamorous music videos on the entertainment television channel.

Taking advantage of interactive capabilities of interactive television (ITV), viewers may be offered a high degree of freedom. Preferably, the viewers are offered the opportunity to take a 'snapshot' of what *they* believe is the most "cool" background image for their mobile telephone whether it is an image of their favorite pop star, a cartoon image or any other preferred image, including inter alia a background environment such as a landscape view. When a viewer presses, for

example, a key on a remote control, a flashy blitz effect preferably appears on a television screen and a few minutes later the viewer preferably receives the background image on his or her mobile phone.

5 It is appreciated that allowing individual creation and flashing of an image may be attractive to many viewers that are also users of cellular telephones and enable them to add individual "statements" and/or "touch" to cellular telephone usage. Such individual statements and touch cannot be achieved by letting the viewers select between a limited range of background images of which they have no control.

10 Similar freedom is preferably offered in defining polyphonic ring tones (rings). The viewers are preferably enabled to 'record' tunes of their liking and preference, for example by pressing 'start' and 'stop' at any point during a music video.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood and appreciated more fully from the following detailed description, taken in conjunction with the drawings in which:

5 Figs. 1 - 3 are simplified pictorial illustrations depicting television screens displayed to a user during offering and using a service of individual determination, selection and downloading of a background image to a mobile telephone of the user;

10 Figs. 4 and 5 are simplified pictorial illustrations depicting display screens displayed to a user during editing of a downloaded background image;

 Fig. 6 is a simplified pictorial illustration depicting a television screen displayed to a user during editing of a polyphonic ring;

15 Figs. 7A and 7B together constitute a simplified block diagram illustration of a system for downloading television information individually determined and selected by a user to an external device; and

 Fig. 8 is a simplified block diagram illustration of a frame recorder indicated "iCapture" in the system of Fig. 7A.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

1 Concept

A service for downloading television information enables a user to individually determine and select information to be downloaded from television, such as images and rings, and to download the images and rings to an external device or external media. The external device may include, for example, any one of the following: a mobile (cellular) telephone; a computing device; an entertainment device; and a communication device. The external media may include media in an external device or media attached to an external device, such as a memory stick that may be associated with an external device comprising a computing device such as a personal computer (PC). For simplicity, the description below refers to a mobile telephone as the external device to which the information is downloaded from television, but it is appreciated that the present invention is not limited to mobile telephones as external devices.

It is appreciated that individual determination and selection of the information to be downloaded from television allows the user to create an individual statement – both in terms of visuals and audio. Preferably, individual determination and selection of the information to be downloaded from television is enabled by allowing the user to take ‘snapshots’ of background images and polyphonic ring tones by simple key pressing on a remote control. The snapshots may be transmitted to mobile telephones. Alternatively, the snapshots may be transmitted to media other than mobile telephones (as part of the very same transmission mechanism) and used respectively, for example, as wallpaper and start-up sounds for PCs.

1.1 Background Images

An example of a screen on a television offering a user an opportunity to download a background image is described below with reference to Fig. 1. Being a fan of, for example, a singer, the viewer may want to ‘snap’ the picture of the singer as she performs live, for example on an entertainment television channel, for use as a background image on his/her mobile telephone.

Such an opportunity is preferably indicated/promoted, for example, by displaying an icon and a remote control reference on the television screen as shown in Fig. 1.

Preferably, when the user presses a dedicated key on a remote control, e.g. the yellow key, the key press is preferably translated to an instruction to instantly take a 'snap' of the singer picture. Some flashy visual blitz effect as illustrated in Fig. 2 may preferably indicate a picture being currently taken – only visible for a very short time equivalent to a couple of frames and preferably starting from the picture frame being snapped.

It is appreciated that although frame accuracy cannot typically be guaranteed, it may come very close. Displaying the flashy effect generally resembles flash usage in a conventional film camera. Such an effect may be used to train the user to capture the exact 'moment' as is the case in conventional film cameras. Since many users have learned to operate film cameras in a satisfactory way, it is anticipated that taking a snapshot may also be learned to provide satisfactory results.

As soon as a picture has been taken (snapped), a message is preferably prompted on the television screen as shown in Fig. 3. The message preferably invites the user to enter a number of his/her mobile telephone where the background image is to be downloaded.

Preferably, a number of validation and confirmation pop-up screens are used before submitting a request to download the snapped picture via a modem (not shown) of a set-top box (STB) (not shown) associated with the television. The pop-up screens may preferably form part of a procedure for order confirmation and monetary transaction for payment for the service.

After the user enters the number of his/her mobile telephone and confirms his/her request and payment, the request is preferably transmitted via the modem to a backend installation of the service, such as a server. The server preferably transmits a desired background image resulting from the snapped picture to the specified mobile telephone, embedded in a JAVA™ application. The primary reason for delivering the background image with a JAVA application is to support simple editing of the background image on a display screen of the mobile

telephone, specifically allowing the user to select and crop an area of the background image as shown in Fig. 4.

It is appreciated that the user may keep the background image as received from the server or edit it in which case the user may go for, as depicted in Fig. 4, a different rendering of the singer ('CROP'). If the user decides to edit the background image, the user may preferably select 'CROP' to bring forward a proportional focus area that can be moved around the display screen by pressing conventional arrow keys. Also, by pressing another set of keys, such as '+' and '-' if available, it may be possible to reduce or enlarge the focus area as shown in Fig. 5.

If the background image is accepted as is, no further communication is required. However, in a case where the background image is edited, another transaction is needed. Preferably, editing of the background image returns a set of coordinates to the server, which will then send a new background image as specified by the user.

Typically, such editing cannot be handled locally on a conventional STB, a personal video recorder (PVR) with a hard disk (HD) being an exception. Therefore, performing the editing on the mobile telephone is considered acceptable. Performing the editing on the mobile telephone also has the advantage of privacy when compared to editing on the television that is accessible by members of the user's family or friends. Additionally, performing the editing on the mobile telephone frees the television for viewing by others.

1.2 Polyphonic Ring Tones

Preferably, recording, downloading and editing of polyphonic ring tones works similarly from a conceptual point of view. Thus, it is possible to use almost the same conceptual framework as described above for 'snapshots' of sound.

Referring now back to Fig. 1, the viewer is preferably able to 'start' and 'stop' recording of, for example, at least a part of a song performed by the singer live on the entertainment television channel for use as a polyphonic ring

tone on his/her mobile telephone. The recording may be started and stopped by the viewer pressing another dedicated key on the remote control, e.g. the blue key. One press on the blue key may be used to start the recording, and another press on the blue key may be used to stop recording. An incrementing bar may preferably
5 be displayed while recording, making sure that the user has an easy-to-read indication of the maximum length of the recording. At the same time, it is a clear indication that the recording has started. A timeout period may preferably be determined so that if the user does not press the key to stop the recording, the recording will be terminated automatically after the timeout period.

10 Similar to background images, the polyphonic ring tone may preferably be transmitted to the mobile telephone embedded in a JAVA application, allowing for simple editing by adjusting start and end points with arrow keys of the mobile telephone as shown in Fig. 6. It is appreciated that if the mobile telephone has the capability of implementing editing changes to the
15 polyphonic ring tone no further communication is required once the editing is finished. However, if the mobile telephone does not have the capability of implementing the editing changes to the polyphonic ring tone, further communication with the server is required to notify the server of the editing changes required in which case the server preferably actually implements the
20 editing changes and transmits an edited version of the polyphonic ring tone back to the mobile telephone.

1.3 Other Downloads

Depending on mobile telephone capabilities, it may be possible to download more than one video frame, such as an entire video clip or commercial.
25 In such a case, the user may download video snapshots by using the 'start' and 'stop' options for starting and ending recording respectively as in the case of ring tone recording. In general, the present invention enables the concept of 'An item that can be 'snapped' can be downloaded'.

1.4 Other Media

The present invention preferably also enables distribution of image or sound snapshots to media other than a mobile telephone. For example, the user may send a snapshot in an e-mail message to his/her own e-mail account or to a friend. The snapshot may then be used as a desktop image or a start-up sound respectively. It is also possible to set-up related websites to which users can submit their snapshots for others to check out (but not copy), participate in competitions, etc.

1.5 Branding

The snapshots offer an opportunity to increase brand loyalty of viewers/users because like pictures in an album users may want to show downloaded snapshots to other people. To further increase brand loyalty, any snapshot delivered by the service may preferably be 'stamped' with a clear rendering of a broadcaster's logo, making sure that nobody has any doubts on where to go for such a snapshot.

1.6 Payments for the Service

As mentioned above, a monetary transaction may be carried out for payment for the service. Payments may be in the form of micro-payments as is well known in the art. It is appreciated that for promotion purposes, some snapshot downloads may be for free whereas other may be downloaded for a price. It is appreciated that snapshots from different television programs may be differently priced.

2 Owners' Rights of Downloaded Snapshots

Broadcasters that are owners of television information that is subject to downloading as snapshots may charge for taking snapshots of their own content. For broadcast material whose rights are not owned by the broadcasters, agreements may be reached in which either the rights for offering the material within the service are acquired by the broadcasters, or revenues for downloading the

snapshots are split between owners of the rights and the broadcasters. Each program offered in the service may preferably include a code identifying a rights owner that is entitled to a portion of payments made by users downloading snapshots from the program.

5 It is appreciated that if a program is not offered in the service for downloading snapshots, the program may be assigned a metadata code or flag that prevents taking and downloading snapshots thus "turning off" the service for the program. Such 'censoring' of the service is typically done by conventional broadcast scheduling systems (not shown).

10 The term "metadata" is used throughout the specification and claims to include information descriptive of or otherwise referring to an interactive content stream. The information referring to the interactive content stream may include, for example, pointers, tags, flags and indexing information. At least part of the information referring to the interactive content stream may be used to enable
15 or disable interactive operations depending, for example, on values assigned to the tags or flags. In a case where the interactive content stream is associated with at least one television program, the pointers, tags, flags and indexing information may point to and index segments of the at least one television program and portions of the interactive content stream. It is appreciated that the contents of the
20 metadata may preferably pertain to either a plurality of users or an individual user. The metadata may be used to enable operations on at least one television program, if associated with the interactive content stream, and/or on interactive content in the interactive content stream.

 The metadata may also be useful in billing users for downloading
25 snapshots of background images and polyphonic ring tones because the metadata identifies a television program from which the snapshots have been downloaded. Identification of the program enables the service to credit a rights owner as mentioned above. It is appreciated that the metadata may also include indications, for example through tags, of different pricing for snapshots taken from different
30 television programs. Preferably, the different pricing is presented to the users before submitting requests to download snapshots.

It is appreciated that by embedding the snapshots in JAVA applications supporting simple editing, the snapshots may preferably be copy protected to prevent a user from distributing the snapshots to other users because the JAVA applications cannot normally be forwarded from one mobile phone to another.

3 Technology

A system for downloading television information individually determined and selected by a user to an external device is described below with reference to Figs. 7A and 7B.

3.1 Storing Frames

Fig. 7A depicts elements at a headend that broadcasts television programs. To store video frames, a frame recorder indicated "iCapture" is preferably utilised at the headend. Basically, iCapture captures a live video stream of a television program, decodes the video stream into frames and stores each of the frames in a frame database that is preferably sufficiently large to hold a significant history of frames. Preferably, iCapture attaches to each frame a frame identifier that uniquely identifies the frame when retrieving frames. A more detailed description of iCapture is provided below in Section 3.6.

3.2 Retrieving Frames

A conventional application server is preferably responsible for retrieving frames. The application server is preferably connected to the frame database and it processes requests from STBs and mobile telephones and generates replies to the mobile telephones. The requests preferably include frame identifiers and the replies preferably include the corresponding frames. It is appreciated that the application server preferably supports and serves requests from a plurality of users simultaneously.

5 When the user uses the service and a frame is selected the server must preferably be notified which frame was selected. Preferably, a unique identification (UID) of the frames is constructed in order to enable notification of selected frames to the server. The UID preferably includes three components: a time code; a frame counter; and a discontinuation counter.

The time code is an integral part of a conventional MPEG video stream. The time code is attached approximately every 1/2 second.

The frame counter specifies how many frames have passed since the latest change in the time code was detected. This counter is implemented by monitoring the time codes in an STB application. The latest received time code is inspected once every 1/25 second. If a new time code is found, it is stored and the frame counter is set to zero. If the same time code is received again, the frame counter is incremented. A similar computation of the frame counter is performed by iCapture, so that a time code and a frame counter together identify each frame.

The frame counter is based on an STB's clock. There is a risk that the STB's clock might drift slightly so that a frame cannot be identified with 100 percent accuracy. However, latency in the user's reaction time is expected to be much higher than such a drift and therefore the STB's clock drift is typically acceptable.

The combination of time code and frame counter is, however, not enough to make a complete unique identification of a frame. The problem is that the time code may have discontinuities. Discontinuities may be caused by

changing or rebooting of MPEG encoding equipment at the headend and may also occur if pieces of pre-encoded MPEG video are comprised in broadcasted video material. The problem with discontinuities is that two different frames may have the same time code. To distinguish between two different frames with the same
5 time code, discontinuities may preferably be counted in both iCapture and the STB application. In other words, a discontinuation counter is preferably added to the UID. The discontinuation counter is incremented each time the time code in the broadcast video material is not continuous. To make it possible for the user to change channels whenever he/she desires, iCapture preferably broadcasts a current
10 discontinuation counter value on a separate data stream encoded, for example and without limiting the description, as a document in bDOM which is commercially available from NDS Ltd., One London Road, Staines, Middlesex TW18 4EX, United Kingdom.

After a period of monitoring the discontinuation counter and the
15 time codes being broadcast, the STB application is typically fully synchronised with the server and the unique identification is preferably determined.

3.4 Request to Server

When the user snapshots an image the UID must be transmitted to the server, which is responsible for constructing the background image and
20 sending it to the mobile telephone.

The UID may preferably be transmitted in two different ways. In the first way, the UID may be transmitted in a return-path via the modem of the STB, for example together with the specified telephone number for which the background image or polyphonic ring tone is intended. Transmission via the
25 modem does not typically require intervention by the user. However, in a case where, for example, the return-path via the modem has low penetration or communication latency is high, transmission via the modem may not be practical and another way to transmit the UID is required.

In the second way, the UID is preferably displayed on the television
30 screen and the user is requested to send a text message, for example an SMS

message including the UID to the server. The server may then return the correct background image. The disadvantage of using the second way is that the user must construct the text message manually with the risk of errors being introduced as a result of human errors. It is appreciated that the two ways may be combined so that
 5 by default the modem is used, but if an error occurs or the modem has not been connected, the user is presented with a message on the television screen requesting him/her to send a text message instead.

3.5 Mobile Phone Application

As mentioned above, a JAVA application may be sent along with the
 10 background image allowing the user to edit the downloaded snapshot. Preferably, the JAVA application may support requests for previous or following images to compensate for the slight risk of the user getting a different frame than what he/she really wanted, for example due to mistiming key presses on the remote control.

3.6 iCapture

iCapture is preferably responsible for constructing a series of
 15 pictures based on an input of streaming video. The pictures must correspond to each frame in the video, so that it is possible to find a picture for each frame. iCapture is also responsible for associating a UID to each frame, allowing the system to search and locate a required picture based on the UID. iCapture is
 20 further responsible for receiving and processing metadata from a broadcaster and dispatching the metadata to other components in the service.

The architecture of iCapture is depicted in Fig. 8 assuming, for example, that an input streaming video inputted to iCapture is an MPEG video. It is however appreciated that if the input streaming video is not an MPEG video, all
 25 components that process MPEG video are preferably replaced by other appropriate components.

It is appreciated that the MPEG video may be encrypted at the headend. In such a case, the MPEG video is preferably decrypted in a decrypter

(not shown) at the headend prior to providing it to iCapture so that iCapture ultimately receives decrypted streaming MPEG video.

iCapture preferably includes the following elements: an MPEG decoder; an image converter; a UID control unit; a metadata control unit; and a database interface that interfaces to the frame database.

The MPEG decoder is preferably responsible for decoding the streaming MPEG video and for producing one output with the time code embedded in the frames and one with still pictures. The decoder needs to ensure that exactly one picture is generated for each frame.

The image converter preferably converts the pictures from a format outputted from the MPEG decoder to a format best suitable for storage. For example, format conversion may change the size of the pictures to fit a size acceptable on mobile telephones.

The UID control unit is responsible for synchronising the UID computed in iCapture with a UID maintained by the application running on a number of STBs. The UID control unit computes for each frame a time code of the frame and thus computes the UID. At the same time, the UID control unit monitors the time codes being broadcast to identify any discontinuities in the time codes. When a discontinuity occurs, the discontinuation counter is incremented.

The metadata control unit is preferably operative to receive metadata from other elements of the headend and to process the metadata. The metadata control unit preferably has two responsibilities:

1. A responsibility for determining whether the service should be available or not. Based on such determination, the metadata control unit sends data to the headend (and ultimately to the set-top boxes), which controls the availability of the service.
2. A responsibility for constructing a reference between the UID and billing information, that is creating a link between the UID and a specific rights owner.

The database interface is preferably operative to insert still pictures and metadata into the frame database. Both the still pictures and the metadata are

preferably indexed by the UID so that it is possible to perform lookups based on UIDs received from STBs and mobile telephone applications.

5 As the UID is based on the time code embedded in the MPEG video, some other way is required to compute the UID if the input for iCapture is in a format other than MPEG. In such a case, some other type of timing information must be provided that can be used as a basis for computing the time code that the MPEG encoder will assign to each frame. Additionally, the MPEG decoder needs to be replaced by another appropriate device that is capable of decoding the format other than the MPEG and generating still pictures from that format.

10 It is appreciated that various features of the invention which are, for clarity, described in the contexts of separate embodiments may also be provided in combination in a single embodiment. Conversely, various features of the invention which are, for brevity, described in the context of a single embodiment may also be provided separately or in any suitable subcombination.

15 It will be appreciated by persons skilled in the art that the present invention is not limited by what has been particularly shown and described hereinabove. Rather the scope of the invention is defined by the claims which follow:

What is claimed is:

CLAIMS

1. Apparatus substantially as described hereinabove.
- 5 2. Apparatus substantially as shown in the drawings.
3. A method substantially as described hereinabove.
4. A method substantially as shown in the drawings.
5. A system substantially as described hereinabove.
6. A system substantially as shown in the drawings.

10

Fig. 1

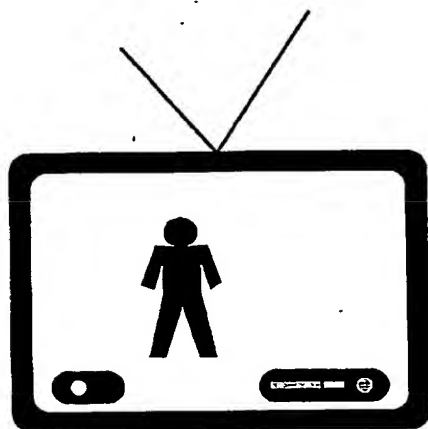


Fig. 2

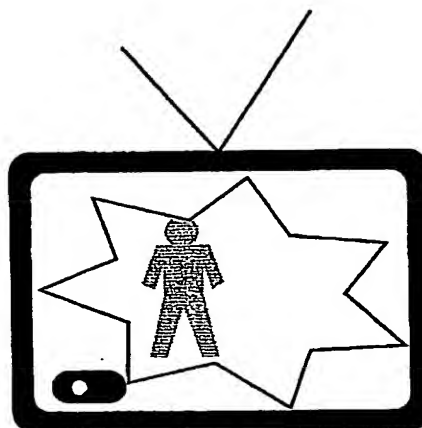


Fig. 3

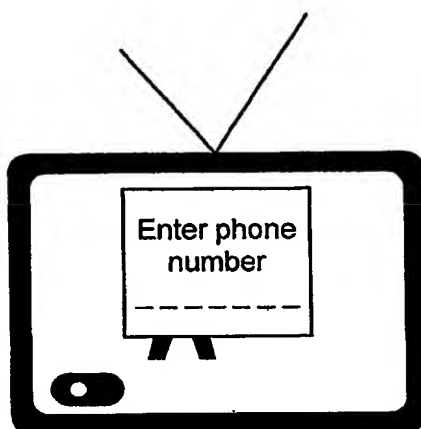
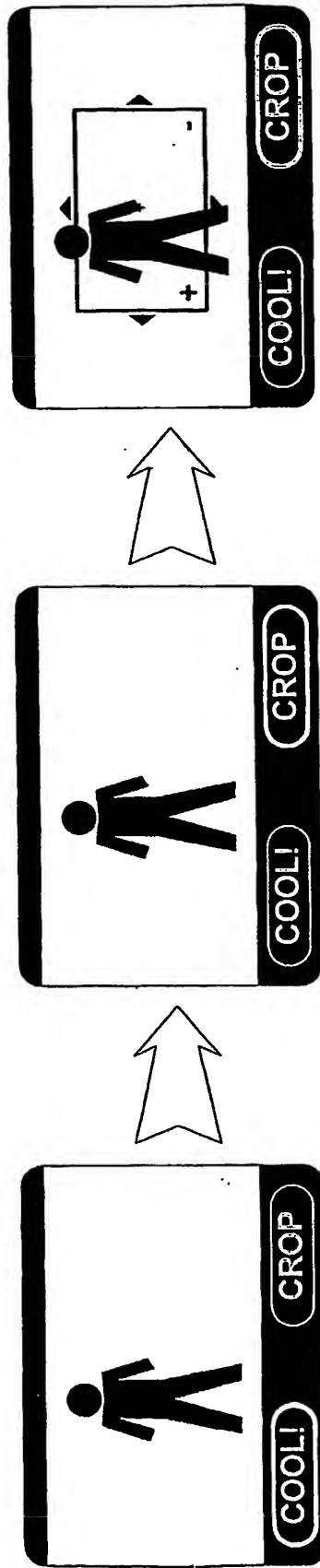


Fig. 4

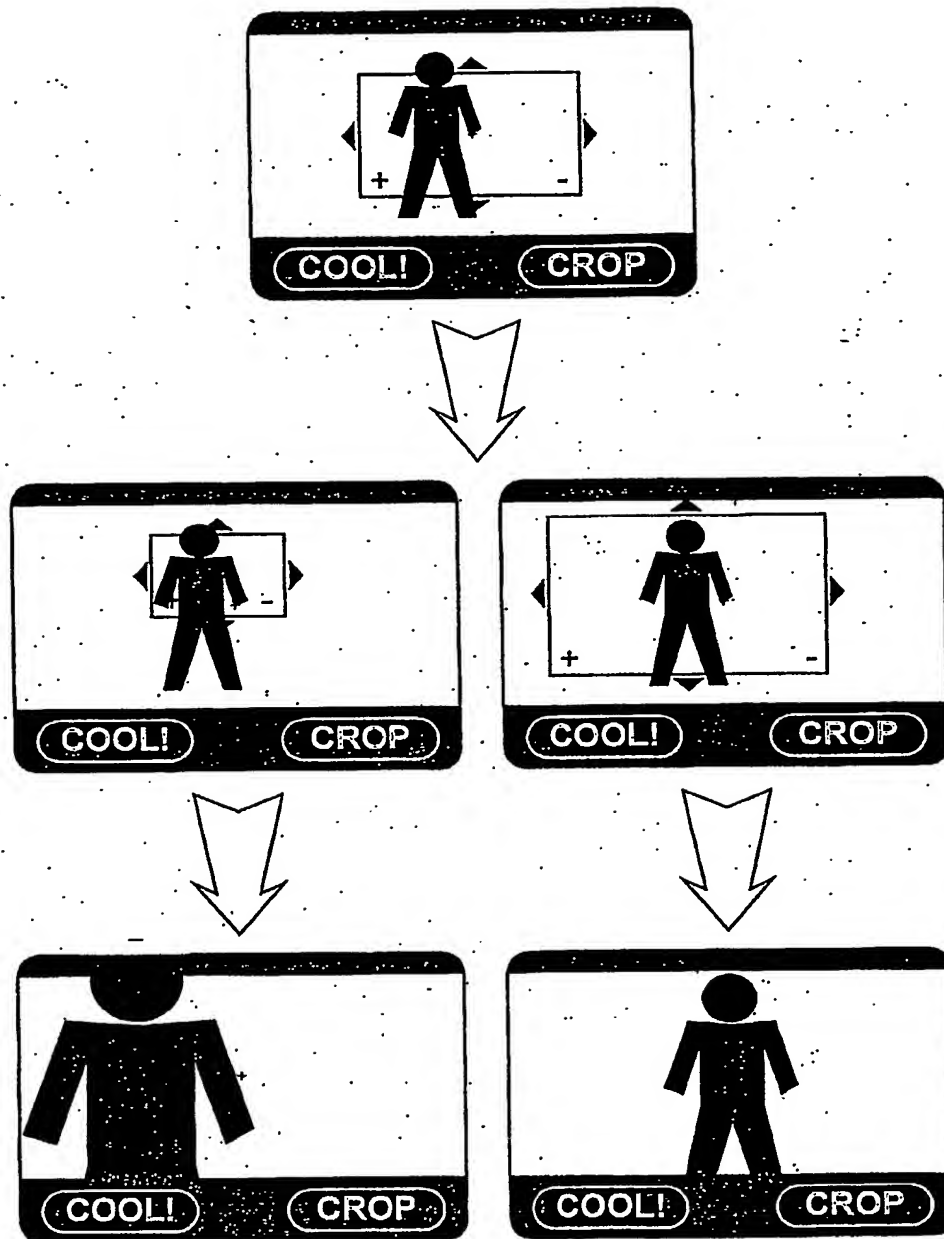


1. Select 'COOL' to keep background image as is

2. To edit the background image, select 'CROP'

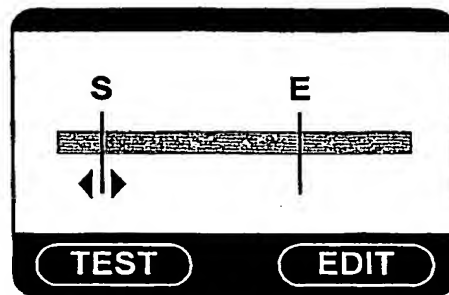
3. A focus area is displayed and can be controlled by arrow keys and + / - on mobile phone

Fig. 5



1. In this case, the viewer has decided to focus (zoom in) on the upper part of the body

2. This viewer has chosen an entirely different composition

Fig. 6

Editing is handled by moving the start (S) and end (E) points with the arrow keys

Fig. 7A

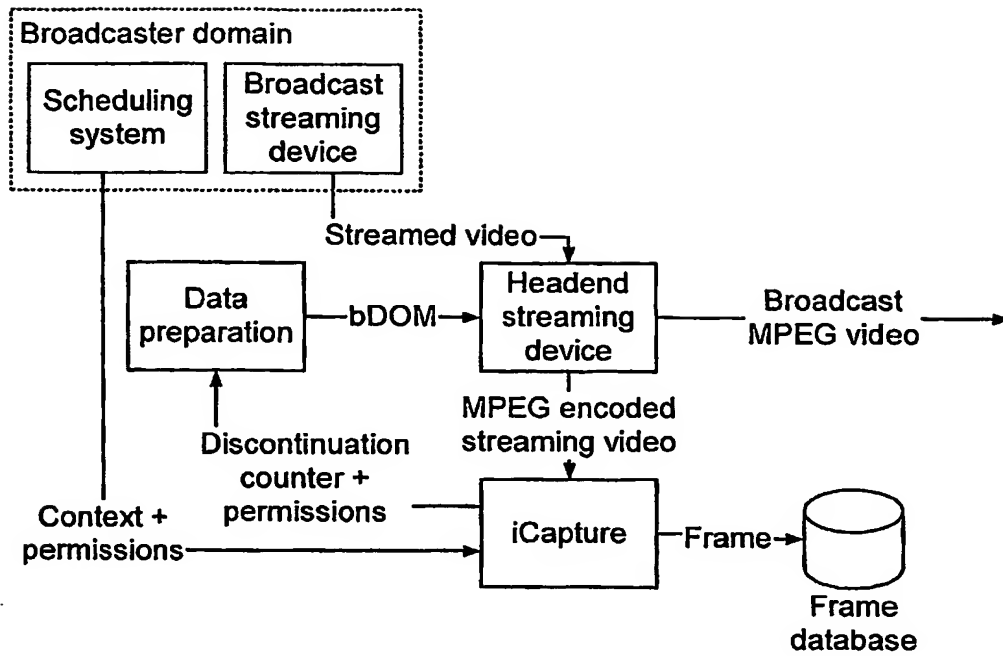


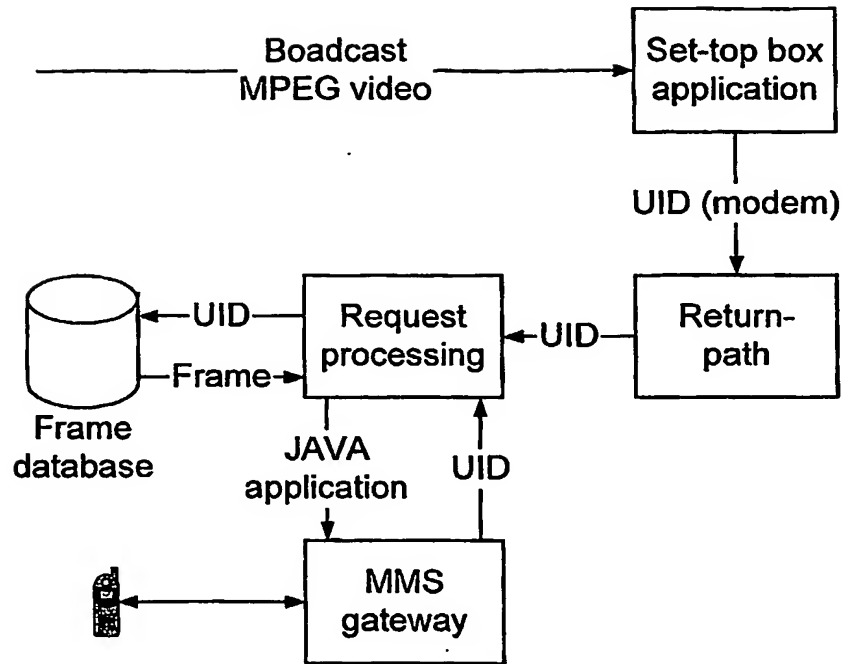
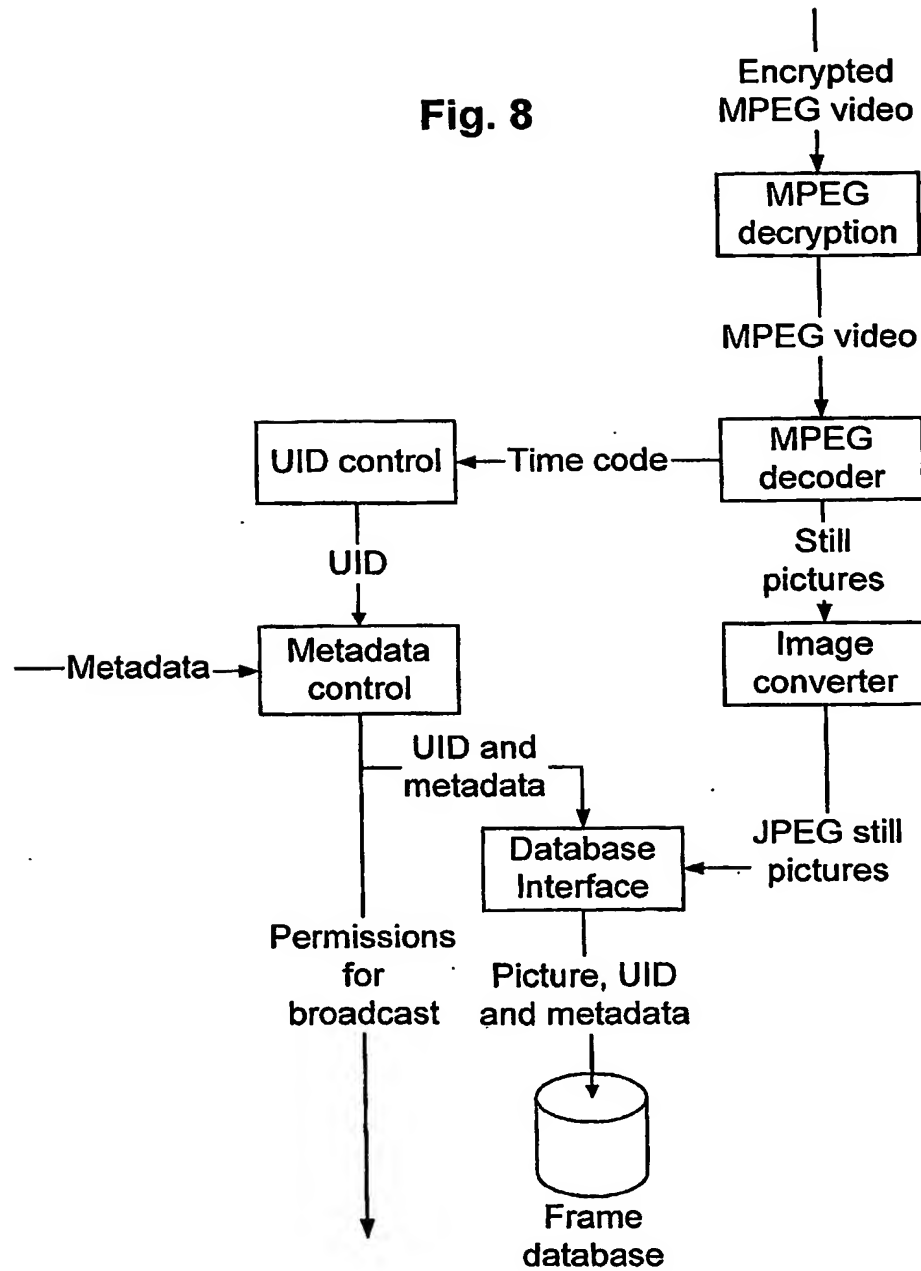
Fig. 7B

Fig. 8

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